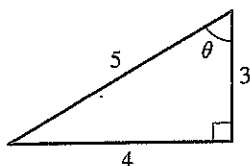


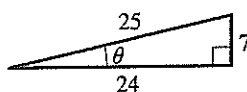
6.2 Exercises

1–6 ■ Find the exact values of the six trigonometric ratios of the angle θ in the triangle.

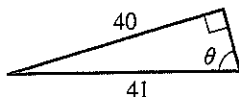
1.



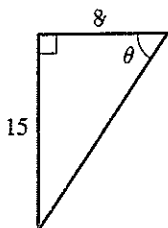
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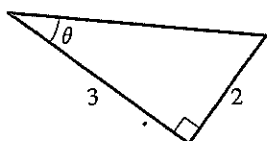
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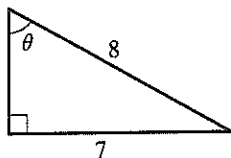
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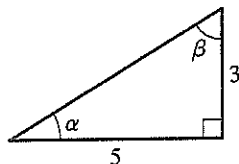


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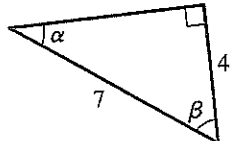


7–8 ■ Find (a) $\sin \alpha$ and $\cos \beta$, (b) $\tan \alpha$ and $\cot \beta$, and (c) $\sec \alpha$ and $\csc \beta$.

7.

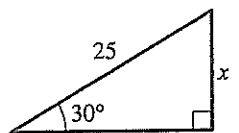


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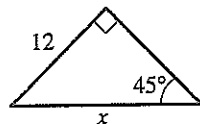


9–14 ■ Find the side labeled x . In Exercises 13 and 14 state your answer correct to five decimal places.

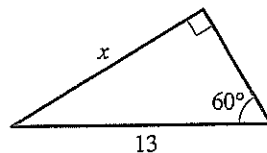
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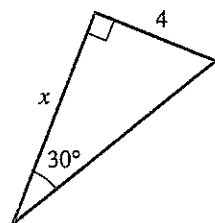
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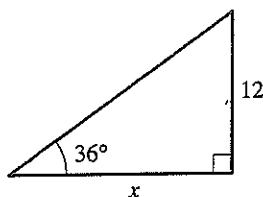
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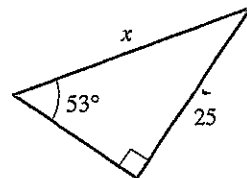
12.



13.

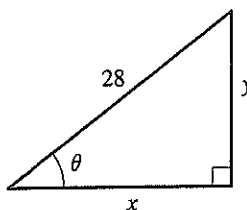


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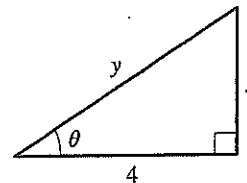


15–16 ■ Express x and y in terms of trigonometric ratios of θ .

15.



16.



17–22 ■ Sketch a triangle that has acute angle θ , and find the other five trigonometric ratios of θ .

17. $\sin \theta = \frac{3}{5}$

18. $\cos \theta = \frac{9}{40}$

19. $\cot \theta = 1$

20. $\tan \theta = \sqrt{3}$

21. $\sec \theta = \frac{7}{2}$

22. $\csc \theta = \frac{13}{12}$

23–28 ■ Evaluate the expression without using a calculator.

23. $\sin \frac{\pi}{6} + \cos \frac{\pi}{6}$

24. $\sin 30^\circ \csc 30^\circ$

25. $\sin 30^\circ \cos 60^\circ + \sin 60^\circ \cos 30^\circ$

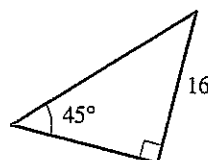
26. $(\sin 60^\circ)^2 + (\cos 60^\circ)^2$

27. $(\cos 30^\circ)^2 - (\sin 30^\circ)^2$

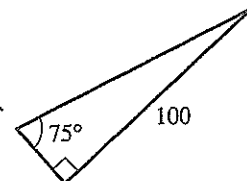
28. $\left(\sin \frac{\pi}{3} \cos \frac{\pi}{4} - \sin \frac{\pi}{4} \cos \frac{\pi}{3} \right)^2$

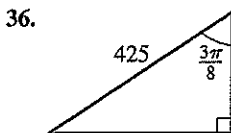
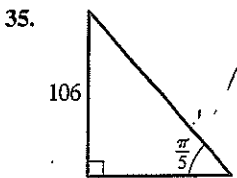
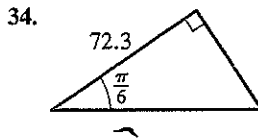
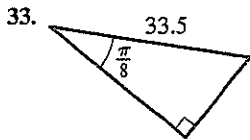
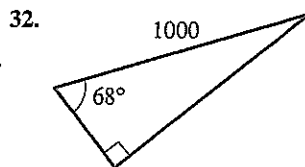
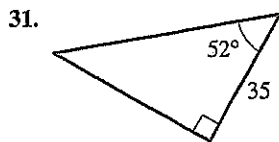
29–36 ■ Solve the right triangle.

29.

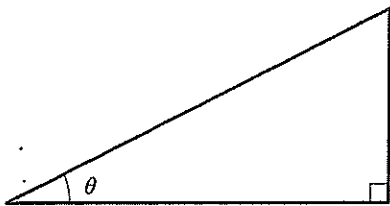


30.



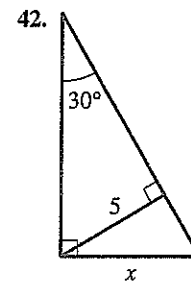
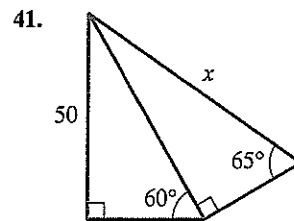
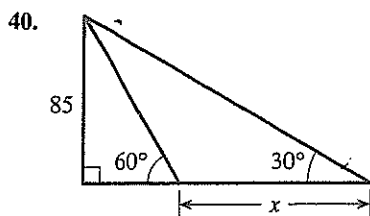
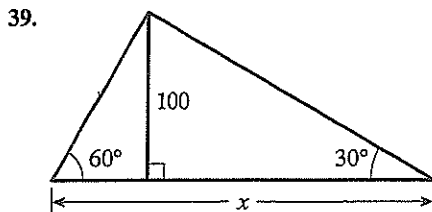


37. Use a ruler to carefully measure the sides of the triangle, and then use your measurements to estimate the six trigonometric ratios of θ .

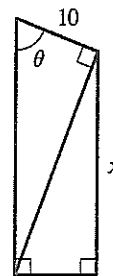


38. Using a protractor, sketch a right triangle that has the acute angle 40° . Measure the sides carefully, and use your results to estimate the six trigonometric ratios of 40° .

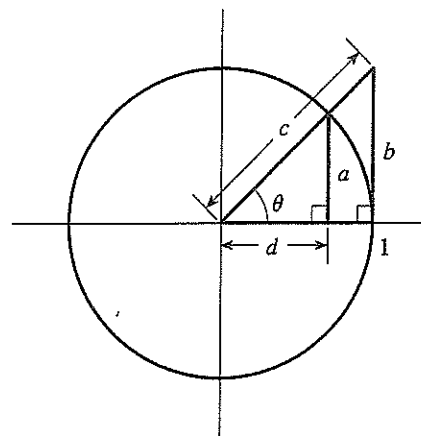
- 39–42 ■ Find x correct to one decimal place.



43. Express the length x in terms of the trigonometric ratios of θ .



44. Express the length a , b , c , and d in the figure in terms of the trigonometric ratios of θ .



Applications

45. **Height of a Building** The angle of elevation to the top of the Empire State Building in New York is found to be 11° from the ground at a distance of 1 mi from the base of the building. Using this information, find the height of the Empire State Building.